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10/047,325	01/14/2002	Thomas R. Hooton	TI-33566	7116

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EXAMINER	
AGHDAM, FRESHTEH N	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 10/047,325	Applicant(s) HOOTON, THOMAS R.	
	Examiner Freshteh N. Aghdam	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *28-32* is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☒ Claim(s) *24-27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 5 is objected to because of the following informalities:

As to claim 5, the phrase "according the transmitter ..." should change to "according to the transmitter ..." at line 4.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 8, and 16-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi (US 2002/0009125), and further in view of Gunn (US 3, 423,754).

As to claim 1, Shi teaches a transmitter operative to generate a chirp signal according to a chirp rate selected for the required bandwidth usage (Par. 20-22) and to reduce transmission errors (Par. 59), the transmitter being operative to transmit the chirp signal; and a receiving station operative to receive an incoming signal (Fig. 6; Par. 61), the incoming signal includes the chirp signal (Fig. 6; Par, 21-22, 60-61). Shi is silent about the transmitter being a base station and chirp signal being substantially orthogonal to delayed versions of the transmitted chirp signal. One of ordinary skill in

the art to would clearly recognize that the base station is a transceiver and includes a transmitter and a receiver. Gunn teaches the chirp signal is substantially orthogonal to the delayed versions of transmitted chirp signal (Fig. 2; Col. 2, Lines 68- Col. 3, Line26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Gunn with Shi in order to utilize signal sampling for obtaining highly time-resolved information about the incoming chirp signal received by the receiver (Col. 2, Lines 28-30).

As to claim 2, Shi teaches the chirp signal being a relatively narrowband signal (Par. 20 and 59).

As to claim 3, one of ordinary skill in the art would clearly recognize that the incoming signal further comprising noise, multipath, and other signals and the receiving station removes noise, multipath, and other signals from the incoming signal to obtain the chirp signal.

As to claim 4, Shi teaches the transmitter further comprising a transmitter chirp generator to convert the transmitter data to a digital chirp signal and a digital to analog converter to the digital chirp signal to the chirp signal (Fig. 5; Par. 20, 41, 59-61). Since in the receiver section the incoming signal is digitized, it is obvious that the transmitted signal had been converted to analog prior to transmission.

As to claims 5 and 8, Shi teaches the receiver further comprising: an analog to digital converter to convert the incoming signal into a received digital signal; and a receiver matched filter matched according to the transmitter chirp generator, to remove unwanted signals from the received digital signal utilizing the chirp rate and to

demodulate the chirp signal to obtain the base station data (Fig. 6; Par. 20-21, 28, 59-61).

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Gunn, further in view of Razavilar et al (US 2003/0104831).

As to claims 6 and 7, Shi and Gunn teach all the subject matters claimed above (Par. 20-22, 59), except for the chirp rate being dynamically modifiable according to transmission errors and bandwidth usage. Razavilar teaches employing a feedback channel in order to dynamically modifying the data rate according to the transmission errors and bandwidth usage (Fig. 6, Par. 60). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Razavilar with Shi and Gunn in order to dynamically (adaptively) control the data rate and power in a communication system to enhance data transmission.

Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi, and further in view of Becker (US 6,218,896).

As to claim 9, Shi teaches a chirp rate determiner operative to receive input data having at least one input signal to determine a chirp rate for the at least one input signal and to generate a composite signal for the at least one input signal (Par. 20-22 and 59-62). Shi is silent about an inverse transform operative to perform an inverse transmform on the composite signal to generate a digital chirp signal. Becker teaches using a chirp Z transform in the receiver (Fig. 3, means 326). One of ordinary skill in the art would clearly recognize that the inverse function is performed in the transmitter. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of

Becker with Shi in order to move data into the time domain (mapping) or map data symbols to orthogonal chirped-time waveforms.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Becker, further in view of Razavilar.

As to claims 10 and 11, Shi and Becker teach all the subject matters claimed above, except for the chip rate determiner further operative to receive feedback data from a receiving station, the feedback data indicating transmission errors and bandwidth usage. Razavilar teaches employing a feedback channel in order to dynamically modifying the data rate according to the transmission errors and bandwidth usage (Fig. 6, Par. 60). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Razavilar with Shi and Becker in order to dynamically (adaptively) control the data rate and power in a communication system to enhance data transmission.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Becker, further in view of Cangiani et al (US 6,741,633).

As to claim 12, Shi and Becker teach all the subject matters claimed above, except for the chirp rate determiner employing simulation to determine the chirp rate. Cangiani teaches simulating a chirp code at different specific frequency (i.e. rate) using simulation (Col. 5, Lines 11-20). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Cangiani with Shi and Becker in order to use simulation method to compare different results and/ or calculate, compute, and extract result for an experiment.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Becker.

As to claim 13, Shi teaches the system further comprising a rate assignment component operative to assign one chirp rate, corresponding to at least one assigned channel and to provide the chirp rate corresponding to the assigned channel (bandwidth) for each of the at least one input signal (Par. 20-22, 59). Shi is silent about storing the at least one assigned chirp rate. One of ordinary skill in the art would clearly recognize that it is well known in the art to store data in a type of memory for further processing.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Becker, further in view of Dong (US 5,297,186).

As to claim 14, Shi and Becker teach all the subject matters claimed above, except for the chirp rate further being operative to determine a baud time and carrier frequency. Dong teaches a baud rate/ carrier decision selection unit (Fig. 1, means 110) that selects the optimal baud rate and carrier (Fig. 1; Col. 3, Lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Dong with Shi and Becker in order to improve data transmission by selecting the optimal baud rate and/ or carrier.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shi and Becker, further in view of Dong and Kerbs et al (US 2003/0054816).

As to claim 15, Shi, Becker, and Dong teach all the subject matters claimed above, see rejection of claim 14, except for the selection of chirp rates, carrier

frequencies, baud times, modulations, and bandwidth being performed by employing a list of available chirp rates, carrier frequencies, baud times, modulations, and bandwidth. Kerbs teaches employing a table containing a list of modulation types, symbol rates (baud), and channel estimation information (Par. 73, table 1). One of ordinary skill in the art would clearly recognize that the table could include available carrier frequencies and bandwidth as it is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Kerbs with Shi, Becker, and Dong in order to enhance data transmission by selecting the optimal data rate, carrier frequency, baud time, modulation, and bandwidth.

As to claim 16, Shi teaches a signal matched filter operative to receive an input signal and to demodulate the input signal according to a stored signal template (predetermined pilot signal) to obtain a digital data signal, the input signal including a chirp signal, the chirp signal being relatively narrowband; and a signal template generator operative to determine the signal template and to provide the signal template parameters associated with the chirp signal (Fig. 6; Col. 20-22, 59-62). Shi is silent about the chirp signal being substantially orthogonal to the delayed versions of the chirp signal. Gunn teaches the chirp signal is substantially orthogonal to the delayed versions of transmitted chirp signal (Fig. 2; Col. 2, Lines 68- Col. 3, Line26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Gunn with Shi in order to utilize signal sampling for obtaining highly time-resolved information about the incoming chirp signal received by the receiver (Col. 2, Lines 28-30).

As to claims 17-19, Shi and Gunn teach all the subject matters claimed above (Par. 20-22, 59), except for the chirp rate being dynamically modifiable according to transmission errors and bandwidth usage. Razavilar teaches employing a feedback channel in order to dynamically modifying the data rate (baud frequency), modulation type, and carrier frequency according to the transmission errors and bandwidth usage (Fig. 6, Par. 60, 71-74). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Razavilar with Shi and Gunn in order to dynamically (adaptively) control the data rate and power in a communication system to enhance data transmission.

As to claims 20 and 21, Shi teaches a transmitter chirp filter comprising a chirp rate determiner (Fig. 5) operative to determine a first chirp rate; and a signal converter operative to convert an input signal to a first chirp signal according to the first frequency carrier; and a receiver chirp filter comprising a receiver filter (Fig. 6) operative to receive an input signal and to demodulate the input signal, the input signal including a second chirp signal, the second chirp signal being relatively narrowband and the first chirp rate and the second chirp rate being substantially equal (Par. 20-22, 59-62). Shi is silent about the second chirp signal is substantially orthogonal to the delayed versions of the second chirp signal. Gunn teaches the chirp signal is substantially orthogonal to the delayed versions of transmitted chirp signal, wherein the first chirp rate and the first chirp signal is substantially equal to the second chirp rate and the second chirp signal (Fig. 2; Col. 2, Lines 68- Col. 3, Line26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Gunn with Shi in order to utilize

signal sampling for obtaining highly time-resolved information about the incoming chirp signal received by the receiver (Col. 2, Lines 28-30).

As to claim 22, Shi teaches the first and second chirp rates are selected to reduce transmission errors and bandwidth usage (Par. 21, 59).

As to claim 23, Shi teaches a communication system comprising determining at least one of a chirp rate, baud time, carrier frequency, and modulation; generating a digital chirp signal according to the at least one of chirp rate, baud time, carrier frequency; and transmitting the digital chirp signal (Fig.5, 6; Par. 20-22, 59-62). Shi is silent about the transmitted chirp signal is substantially orthogonal to the delayed versions of the transmitted chirp signal. Gunn teaches the chirp signal is substantially orthogonal to the delayed versions of transmitted chirp signal (Fig. 2; Col. 2, Lines 68-Col. 3, Line26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Gunn with Shi in order to utilize signal sampling for obtaining highly time-resolved information about the incoming chirp signal received by the receiver (Col. 2, Lines 28-30).

Allowable Subject Matter

Claims 28-32 are allowed.

As to claims 28-32, the prior art of record fails to teach the limitations cited in the claim.

Claims 24-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 24-27, the prior art of record fails to teach the limitations cited in the claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Raphaeli (US 6,064,695) see Col. 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam
October 2, 2005

Kevin M Burd
KEVIN BURD
PRIMARY EXAMINER